

1                                    Abstract of the Disclosure

2

3            The method for forming a flowable dielectric layer is

4 employed to use a barrier layer on sidewalls of patterned

5 flowable dielectrics, thereby preventing a bridge phenomenon

6 between adjacent contact plugs. The method includes steps of:

7 forming a plurality of patterns on a semiconductor substrate,

8 wherein narrow and deep gaps are formed therebetween; forming

9 a flowable dielectric layer so as to fill the gaps between the

10 patterns; carrying out an annealing process for densifying the

11 flowable dielectric layer and removing moisture therein;

12 forming a plurality of contact holes by selectively etching

13 the flowable dielectric layer so as to expose predetermined

14 portions of the semiconductor substrate; forming a barrier

15 layer on sidewalls of the contact holes for preventing micro-

16 pores in the flowable dielectric layer; carrying out a

17 cleaning process in order to remove native oxides and defects

18 on the semiconductor substrate; and forming a plurality of

19 contact plugs by filling a conductive material into the

20 contact plugs.

21